

Wound Filter Cartridges

Multipurpose Filtration Solutions with Cardinal Wound Filter Cartridges

Effective removal ratings at nominal 90% efficiency from 0.5 μm to 150 μm

Wound Depth Cartridge Design & Function


Wound cartridges provide true depth filtration utilizing thousands of tapered filtering passages of controlled size and shape.

Each layer of roving contributes to true depth filtration by trapping its share of particles. Wound cartridges offer a gradual pressure increase during cartridge life versus surface-type media that have an abrupt flow cutoff when loaded. In addition, the irregular outer layer reduces surface blinding, assuring longer cartridge life and full cartridge dirt-holding capacity utilization.

Applications

- Photo Solutions
- Potable Liquids
- Edible Oils
- Vegetable Oils
- Petroleum Oils
- Amines
- Organic Acids & Solvents
- Prefilter for RO Membranes
- Water
- Oxidizing Agents
- Concentrated Alkalines



 Made in the USA

Benefits

- Multiple-length cartridges minimize change out time, eliminate spacers and are available to fit any industry standard filter vessel.
- FDA grade polypropylene (DOE only) cartridges certified to ANSI/NSF61 standard for contact with drinking water components.
- Continuous strand-winding geometry provides performance consistency.
- One-piece metal extended center core option eliminates need for cartridge guides in all industry standard multi-cartridge vessels.
- A special snap-in extender is available for polypropylene cores.
- Cotton, rayon, polypropylene, nylon and polyester materials meet FDA regulations for indirect food contact under 21CFR177 (current revision).
- Various O-ring and end cap options are available.



| Specifications | |
|--|--|
| Nominal Removal Ratings: | @ 90% efficiency from 0.5 µm to 150 µm |
| Maximum Recommended Operating Conditions: | |
| Change out ΔP | 35 psi (2.1 bar) |
| ΔP @ Ambient Temperature | 60 psi (4.1 bar) |
| Flow Rate | Up to 10 GPM per 10 in length |
| Temperature | (See Temperature Chart) |
| Dimensions | (R) 1 in ID x 2-7/16 in OD x up to 50 in lengths (BB) 1 in ID x 4 - 1/2 in OD x up to 20 in lengths |

Temperature Chart

| Cartridge Material | Metal Core | Polypropylene Core | Glass-Filled Polypropylene Core |
|--|-----------------------|----------------------|---------------------------------|
| Cotton | 250 deg F (121 deg C) | 120 deg F (49 deg C) | - |
| Glass | 750 deg F (402 deg C) | - | - |
| Nylon | 275 deg F (135 deg C) | 120 deg F (49 deg C) | - |
| Polypropylene | 200 deg F (93 deg C) | 120 deg F (49 deg C) | 200 deg F (93 deg C) |
| Polyester | 275 deg F (135 deg C) | 120 deg F (49 deg C) | - |
| Rayon | 250 deg F (121 deg C) | 120 deg F (49 deg C) | - |
| Maximum Operating Temperature @ 35 psid | | | |

Note: All glass fiber cartridges (UG, BG) have core cover as standard component (no adder).
Baked glass fiber (BG) cartridges are individually wrapped (no adder).

Flow Rate and Pressure Drop Formulas

- Flow Rate (GPM) = (Clean ΔP x Length Factor) \div (Viscosity x Flow Factor)
- Clean ΔP = (Flow Rate x Viscosity x Flow Factor) \div (Length Factor)

Table 1: Wound Cartridge Flow Factors (psid/gpm @ 1 cks)

| Micron (μm) | Polypropylene Polyester Nylon | | Cotton Rayon | | Glass | |
|--------------------------|-------------------------------|-------------|--------------|-------------|---------|-------------|
| | Aqueous | Solvent/Oil | Aqueous | Solvent/Oil | Aqueous | Solvent/Oil |
| 0.5 | 0.9924 | 1.8350 | 2.6590 | 1.3800 | 0.5000 | 0.5000 |
| 1 | 0.7463 | 1.0000 | 2.0000 | 0.7519 | 0.4211 | 0.4211 |
| 3 | 0.3330 | 0.5800 | 0.6250 | 0.3003 | 0.3478 | 0.3478 |
| 5 | 0.2381 | 0.3003 | 0.3636 | 0.1949 | 0.1951 | 0.1951 |
| 10 | 0.1429 | 0.1299 | 0.1931 | 0.1000 | 0.1430 | 0.1430 |
| 20 | 0.0898 | 0.0560 | 0.1075 | 0.0350 | 0.1096 | 0.1096 |
| 30 | 0.0704 | 0.0200 | 0.0855 | 0.0175 | 0.0816 | 0.0816 |
| 50 | 0.0595 | 0.0141 | 0.0709 | 0.0130 | 0.0678 | 0.0678 |
| 75 | 0.0538 | 0.0120 | 0.0645 | 0.0100 | 0.0611 | 0.0611 |
| 100 | 0.0500 | 0.0080 | 0.0624 | 0.0065 | 0.0590 | 0.0590 |

Table 2: Wound Cartridge Length Factors

| Length (in) | Length Factor |
|-------------|---------------|
| 10 | 1.0 |
| 20 | 2.0 |
| 30 | 3.0 |
| 40 | 4.0 |
| 50 | 5.0 |

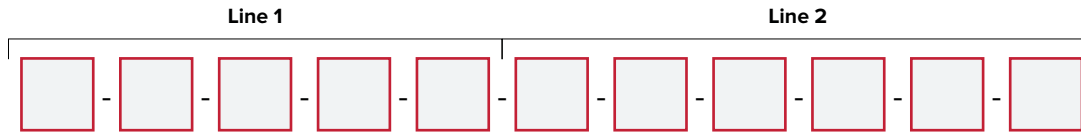
Table 3: Nominal Micron Ratings Liquids / Gas

| Micron (μm) | Liquids | Compressed Air & Gas | Glass Fiber |
|--------------------------|---------|----------------------|-------------|
| 0.5 | 0.5 | < 0.5 | < 1 |
| 1 | 1 | < 1 | < 1 |
| 3 | 3 | 1 | < 1 |
| 5 | 5 | 2 | < 1 |
| 7 | 7 | - | < 1 |
| 10 | 10 | 3 | < 1 |
| 15 | 15 | 5 | 1 |
| 20 | 20 | 7 | 3 |
| 25 | 25 | - | - |
| 30 | 30 | 10 | 5 |
| 40 | 40 | - | 7 |
| 50 | 50 | 12 | - |
| 75 | 75 | 13 | 10 |
| 100 | 100 | 15 | 10 |
| 150 | 150 | - | 100+ |

Definitions

- Clean ΔP is PSI differential at start (cartridge only).
- Viscosity in centistokes. Use conversion tables for other units.
- Flow Factor (Table 1) is ΔP /GPM at 1 cks for each 10 in length.
- Length Factors (Table 2) convert flow or ΔP from 10 in (single length) to required cartridge length.

Ordering Information

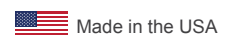


Line 1

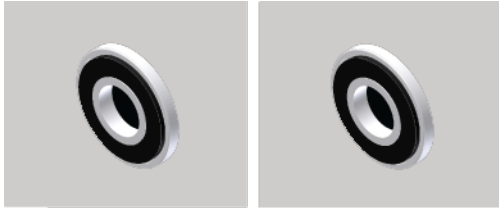
| □ | - | □ | - | □ | - | □ | - | □ | - | □ | - | □ | | |
|---------------|-----------------------|----------------------------------|--|---|---|----|----|-----|---------------------------|------|----------------------------------|-------|--|--|
| Series | | Materials of Construction | | Nominal Micron Ratings Liquids / Gas | | | | | Cartridge Diameter | | Cartridge Length (in) | | | |
| Code | Description | Code | Description | Micron | W | WE | WU | WWX | Code | Code | Description | Code | Description | |
| W | Standard String Wound | P ^{1,2,3} | Polypropylene | 0.5 | - | - | X | - | 0.5 | R | Standard 1 in ID x 2- 7/16 in OD | 3 | 3 | |
| WE | Economy | FB | Fibrillated Polypropylene | 1 | X | X | - | X | 1 | BB | Large 1 in ID x 4- 1/2 in OD | 4 | 4 | |
| WU | Ultrafine | BC ^{1,2,3} | White Cotton (bleached) | 3 | X | X | - | X | 3 | | | 5 | 5 | |
| WWX | Extended Life SW | UC ^{1,2} | Natural Cotton (unbleached) | 5 | X | X | - | X | 5 | | | 6 | 6 | |
| | | BG | Baked Glass Fiber | 7 | X | - | - | - | 7 | | | 7 | 7 | |
| | | UG | Unbaked Glass Fiber | 10 | X | X | - | X | 10 | | | 8 | 8 | |
| | | FC ^{1,2,3} | FDA Grade Cotton | 15 | X | - | - | - | 15 | | | 9.75 | 9-3/4 | |
| | | FE | FDA Grade Polyester | 20 | X | X | - | X | 20 | | | 9.8 | 9-7/8 | |
| | | FN | FDA Grade Nylon | 25 | X | X | - | - | 25 | | | 10 | 10 | |
| | | FP ^{1,2,3} | FDA Grade Polypropylene | 30 | X | X | - | X | 30 | | | 19.5 | 19-1/2 | |
| | | FR | FDA Grade Rayon | 40 | X | - | - | - | 40 | | | 20 | 20 | |
| | | | Note: 1 WE-Series, 2 WU-Series, 3 WWX-Series | 50 | X | X | - | - | 50 | | | 29.25 | 29-1/4 | |
| | | | | 75 | X | X | - | - | 75 | | | 30 | 30-3/16 | |
| | | | | 100 | X | X | - | - | 100 | | | 39 | 39 | |
| | | | | 150 | X | - | - | - | 150 | | | 40 | 40-3/16 | |
| | | | | Note: Order according to Liquids micron rating. | | | | | | | | | Call for Custom Length (less than 50 in) | |

Line 2

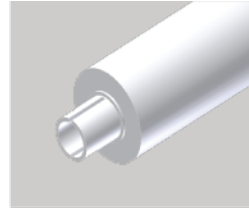
| □ | - | □ | - | □ | - | □ | - | □ | - | □ | |
|----------------------|---|----------------------------|--------------------|------------------------------|--|-------|----------------------|-------|--|------|---|
| Core Material | | Core Cover Material | | End Cap Configuration | | | End Treatment | | Seal | | Shrink Wrap |
| Code | Description | Code | Description | Code | Description | Code | Description | Code | Description | Code | Description |
| GP | Glass-Filled Polypropylene | Blank | None | Blank | None | Blank | None | Blank | None | | For Individually shrink wrapped cartridges add a 'W' to the end of the ordering code. |
| P | Polypropylene | B | Nylon | DG* | Double Open End with gaskets | D | Sodium Silicate | B | Buna-N | | |
| SS | 304 Stainless Steel | V | Nonwoven Polyester | 2C* | 222 Open End /Flat Closed End | L | Lacquer | E | EPDM | | |
| 16S | 316 Stainless Steel | W | Cellulosic Paper | 2F* | 222 Open End/Fin Closed End | M | Singed | S | Silicone | | |
| 16SP | 316 Stainless Steel, Passivated (Special Order) | Y | Polypropylene | 6C* | 226 Open End/Flat Closed End | | | V | Viton® | | |
| T | Tinned Steel | | | 6F* | 226 Open End/Fin Closed End | | | T | Teflon® Encapsulated Viton® | | |
| | | | | XP | Polypropylene Core Extender | | | | Viton® is a registered trademark of E.I. DuPont de Nemours & Co., Inc. | | |
| | | | | XM | Tinned Steel Core Extender | | | | | | |
| | | | | XM | 304 SS Core Extender | | | | | | |
| | | | | XM | 316 SS Core Extender | | | | | | |
| | | | | OP | Standard Open End/ Polypropylene Spring Closed End | | | | | | |
| | | | | XOP | Extended Core Open End/Polypropylene Spring Closed End | | | | | | |
| | | | | Specify | Select from "Seal" Table | | | | | | |
| | | | | | Call for Special Orders | | | | | | |



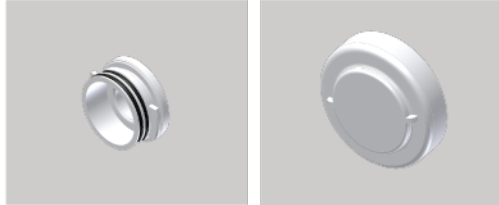
End Configurations



DG - Double Open End (DOE) with Gaskets (DG)



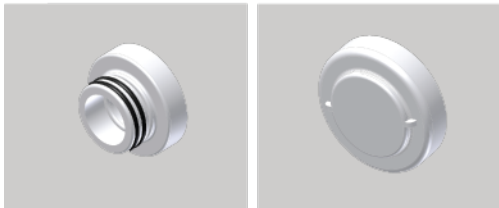
XP, XM - Core Extender



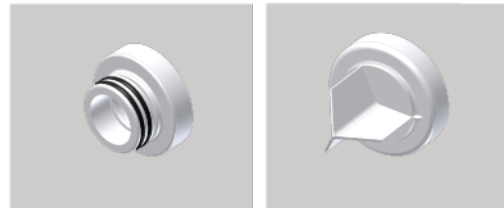
6C - 226 O-Ring Open End / Closed End Flat



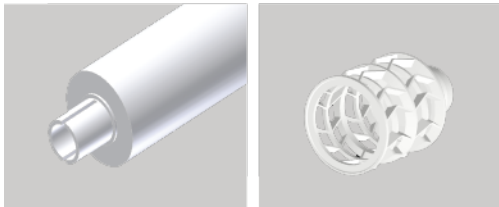
6F - 226 O-Ring Open End / Closed End Fin



2C - 222 O-Ring Open End / Closed End Flat



2C - 222 O-Ring Open End / Closed End Fin



XOP - Extended Core Open End / Closed End
Polypropylene Spring



OP - Gasketed Open End / Closed End
Polypropylene Spring

Many other end configurations are available meeting virtually every industry standard design. Please inquire for your requirements. Minimum order levels may apply.

Example 1: W-P-10-BB-9.8-P Cardinal wound depth filter cartridge industrial grade polypropylene 10 micron 1 in ID x 4-1/2 in OD x 9-7/8 in length polypropylene core without core cover double open end (DOE) without gasket. 120 deg F @ 35 psid. 12/case.

Example 2: W-FP-1-R-10-P-2F-V Cardinal wound depth filter cartridge FDA Grade polypropylene 1 micron 1 in ID x 2-7/16 in OD x 10 in length polypropylene core without core cover 222 O-ring, closed fin end and Viton gasket/o-ring. 120 deg F @ 35 psid. 30/case.